

# Comprehensive Lighting Amendment Package

2003

Provided by the  
Newmarket Planning  
& Building Department



## **Lighting Ordinance from the Town of Newmarket Zoning Ordinance**

### **7.06 Lighting and illumination.**

- (A) This ordinance is intended to eliminate problems of glare, minimize light trespass and obtrusive light created by improperly designed and installed outdoor lighting. Further purposes are to enhance and protect the quality of the New Hampshire night sky, Newmarket's rural character, and conserve energy and resources. These concerns are balanced while maintaining safety, security and productivity by establishing limits for the area that certain kinds of outdoor-lighting fixtures can illuminate and by limiting the total allowable illumination in the Town of Newmarket.
- (B) Prohibitions. This section applies to all lighting within the Town of Newmarket on any site except for legal non-conforming uses as covered in § 1.05 and temporary or emergency lighting.
  - (1) Mercury Vapor Lamps Fixtures and Lamps. The installation of any mercury vapor fixture or lamp for use as outdoor lighting is prohibited.
  - (2) Laser Source Light. The use of laser source light or any similar high intensity light for outdoor advertising or entertainment, when projected above the horizontal is prohibited.
  - (3) Searchlights. The operation of searchlights for advertising purposes is permitted by permit issued by the building inspector for a period of two nights (regardless of hours in operation) per year per lot.
  - (4) Neon. Neon lighting shall be limited to signage use and must be located within the exterior dimension of the sign as approved under this ordinance. Neon lighting as architectural accents or used as window displays is prohibited.
- (C) Residential lighting. These provisions are intended to prevent private and public nuisances and protect property values. This section applies to existing and proposed single-family and duplex residential uses.
  - (1) Residential lighting uses shall not be used or maintained in such a fashion as to inhibit or interfere with the use and enjoyment of neighboring properties.
  - (2) Spot lights, flood lights and other bright security lighting shall be limited in such a fashion as to not direct light onto neighboring property. Security lighting using motion detection switches are encouraged, but continual lighting must be angled or shielded in such a fashion as to not produce glare onto neighboring property, particularly dwelling units.

- (3) Accent lighting, low wattage seasonal lighting and other fixtures commonly associated with residential uses are not intended to be prohibited by this ordinance.
- (D) Non-residential and multi-family uses. These provisions are intended to provide for more comprehensive lighting regulations due to potential negative impact on a greater number of residents and the public from inappropriate lighting installation or fixtures. In addition, it is the intent of these restrictions to prevent lighting conflicts and competing lighting installations in commercial areas of the Town of Newmarket, particularly where the Town encourages mixed-use development. This section applies to non-residential uses and any structure with three or more residential units. The Planning Board shall adopt regulations as part of the Site Plan Review Regulations that implement the purpose and intent of this ordinance.
- (1) A Building Permit shall be required prior to the installation of any new fixtures on existing non-residential and multi-family uses. If the original Site Plan Approval granted by the Planning Board specified, in detail, the type and nature of lighting, any increase or change in lighting that may have an increased impact on the site shall be referred to the Planning Board for Site Plan Review. The Building Official shall approve a permit for other installations upon a finding that the fixtures comply with the following general lighting requirements.
  - (2) General Lighting Requirements:
    - (a) All lighting in the Town of Newmarket is required to have full-cutoff shielding, except for that portion of lighting installation that is consistent with the Millyard Lighting Theme as defined in the Newmarket Planning Board Site Plan Review Regulations.
    - (b) The new installation of up-lighting, by any method, is prohibited; however, the limited use of upward landscape lighting on a case-by-case basis may be approved provided the lighting does not spill onto neighboring properties or public ways.
    - (c) Non-cutoff wallpack type fixtures are prohibited.
    - (d) Existing lighting sources that do not present a health and safety issue with respect to glare on public ways or nuisance as a result of off-site illumination shall be exempt from the provisions of this ordinance.
  - (3) New fixtures accompanying establishment of new uses or change of use that requires Site Plan Review shall have lighting plans approved as part of the Site Plan Review process.

## **Planning Board Minutes**

### **010802 Meeting of the Planning Board**

#### **Agenda Item #7 – Old Business**

There was a discussion of a lighting ordinance and a nuisance ordinance.

**Lucy Roy**, 4 Pendergast, stated that her neighbor has a light in their driveway that shines into her house and they are unable to sleep at night. They did not want their house to have daylight at night. They approached the neighbor with the light and the neighbor “freaked out”. Three other neighbors have a problem with the light being there. **Mr. Roy** stated that the light surprised even the Chief of Police and the police had agreed that their request for the neighbor to do something about it was reasonable. The neighbor with the light refused to talk to them or the police. **Lucy Roy** stated that the light was on at 3:00 a.m. and it wakes them up, even with blinds.

There was discussion of a workshop to discuss these issues and other zoning issues.

It was decided that there would be a workshop on January 22, 2002, at 7:00 p.m. in the Town Council Chambers.

### **011601 Minutes of the Planning Board**

#### **Lighting**

**Jeremy Reickes**, from Stratham, spoke about lighting. He felt lighting was a quality of life issue.

Among topics covered were types of lighting, directed lighting, candle power and lumens. He mentioned lighting in areas of Newmarket. He stated that the lighting on the billboards on Route 108 was good lighting and Rivermoor Landing lighting was good, as there was no glare. He stated that he visited the Nichols Avenue area and he thought that there had to be a crime problem, because the light level is higher than in parking lots in San Jose and parts of Los Angeles. He drove down Nichols Avenue and there was not one house on the street that had their blinds open, because of the light levels on the houses. He stated that there was a light trespass issue. When he drove around other parts of Newmarket, the streetlights seemed to be adequate.

He stated that there had been recent studies that show that continuous lighting can affect the levels of melatonin and they think that there are ties showing the ambient levels at night and risk of cancer.

He stated that eyes are drawn to bright light. This is called the ratcheting effect. He stated that this is a "moth to the flame" effect. Companies use the guise of safety to justify the bright lighting. He stated there are no studies that show conclusively either way, including a study that was just done in 1999, that lighting or not lighting a particular area contributes to or decreases the amount of crime. In St. Louis there was an area that

was crime-ridden, so they lit it up and the criminals adapted to the light levels. They watch more for the police, they can see them coming from further away, and the police cannot sneak up with their lights off, because the cruiser is now lit up. Using the guise of safety to justify ratcheting the light levels is disingenuous.

Much of the information that he gave to the Board came from the International Dark Sky Association. This is a grass roots organization with 6,500 members in the world. He stated that they have a wealth of information on the Internet.

He was asked about flagpole lighting. In NH, you are allowed to leave a nylon flag up 24 hours a day. Flags should be lit from the bottom. A manufacturer makes a fixture that goes on the top. The bad way to light a flag would be like you see at Gil's, with two 1,000 watt lights that light up the flag and everything else. At the Stratham Circle there is a business with a pole mounted 1,000 fixture aimed sort of at the flag. If you come down from Portsmouth, you can see the distribution shooting into the trees and into the sky. He can see the glow from his house when it is cloudy. The key thing is the appropriate amount of light. You could light it with a 35-watt fixture aimed to run right up the flagpole. The preferred method is to take the flag down and put it back up in the morning.

He stated that, he is not an astronomer, but he knows there is a milky way out there. He can see very little of it now, whereas twenty years ago, you could not see your hand in front of your face at night.

## **031202 Meeting of the Planning Board**

### **Agenda Item #7 – Old Business**

#### **Lighting Ordinance**

**Clay Mitchell** distributed language for a lighting ordinance for discussion. He stated that this ordinance would require that any change of use or subdivision or site plan review would require that existing fixtures be brought into compliance. Site Plan review would be required to add lighting. **Lorrienne Caprioli** asked about lights in signage. **Clay Mitchell** stated that this ordinance was meant to go with the sign ordinance.

**Rose-Anne Kwaks** felt that requiring existing lighting to be brought into compliance, if an accessory use was added or minor site plan done, was a burden on a business. She felt that was unfairly directed at certain businesses, including her own. She felt that existing lighting was grandfathered.

There was discussion of the ordinance dealing with inappropriately installed or new lighting. There was a question of what is a light trespass in an area with overlapping businesses. There would be multiple sources of light in densely developed areas. There was comment that this ordinance was long overdue, as there has been comment about lighting problems over the last five years.

**Clay Mitchell** stated that lighting was difficult to address. If light meters are used, different meters can read differently. In Stratham, someone got a 13-passenger van and drove the Planning Board and public up and down Portsmouth Avenue to determine what people liked and did not like in lighting. It is a difficult thing to address. It was

mentioned, during discussion, that having the Building Inspector determine if there was a nuisance would be the best way to deal with this, as it could be appealed to the ZBA, having people make the determination in each individual case, rather than just measuring light.

There was a question of whether this would encompass street lighting, as the Nichols Avenue streetlights are second floor height, where bedrooms are located. **Clay Mitchell** stated that this would not involve streetlights.

He also stated that it would be easier for an applicant to say that they want lights and then give an example of what an area business has that is close to what they want. Lighting is a difficult thing, one person sees light pollution and the other sees economic opportunity or security. This ordinance will only be burdensome if it is not clear. The issue with nuisance lighting is complicated.

Residential walkway lighting was mentioned. **Clay Mitchell** stated that he could add language to clarify. The language presented tonight is only a starting point for discussion. The typical hurricane porch lights are not involved.

There was discussion of how any lighting problems being addressed now were complaint driven. **Clay Mitchell** stated that, if there is a complaint about lighting, there has to be an ordinance in place in order to resolve it. It is difficult for someone to make a determination on lighting issues with no direction.

It was suggested that any complaints about lighting should come from abutters for action to be taken with this ordinance and not come from people passing through. This ordinance should not allow anyone to drive around and complain about every light in town. A person who lives on Riverbend Road, for example, would not have grounds to complain about a light on Pendergast. The line needs to be drawn between unnecessary complaints and one based on a real nuisance.

**Bill Arcieri** asked if anyone from the public would like to comment.

**Lucy Roy** asked if lighting would be grandfathered. Discussion by the Board followed involving comments that, if something was a nuisance, they should have the ability to deal with it. One light on a property may be a nuisance and the Board might not have foreseen that when it was approved. The Board would never knowingly authorize lighting to be a nuisance. Neighbors should have recourse. This ordinance is protective and would allow ways to deal with it. Having a subjective group of people looking at cases, the Building Inspector and ZBA, was generally well received. It was stated that the Board approves lighting, but no Board has the authority to allow all lighting to spill. It was stated that there have been lighting complaints over the years. Some are valid and some are based in other problems between abutters.

The Board felt that any language on this should be contained within the Zoning Ordinance.

**Site Plan Review Regulations - Section 3.16 – This section refers to applications before the Planning Board. This section will not apply to sites that can be issued building permits in accordance with § 7.06(D)(1) of the Zoning Ordinance.**

(A) Regulation of non-residential and multi-family dwelling unit lighting.

These regulations are intended to reduce the problems created by improperly designed and installed outdoor lighting. This section shall apply to non-residential development and . This section is intended to eliminate problems of glare, minimize light trespass, obtrusive light, protect the quality of the New Hampshire night sky, Newmarket's rural character, and conserve energy and resources. These concerns are balanced while maintaining safety, security and productivity by establishing regulations which limit the area that certain kinds of outdoor-lighting fixtures can illuminate and by limiting the total allowable illumination of lots located in the Town of Newmarket.

(1) Definitions: For the purposes of this Regulation, terms used shall be defined as follows:

Cut-off Angle (*of a luminaire*) - The angle formed by a line drawn from the direction of the direct light rays at the light source with respect to the vertical, beyond which no direct light is emitted.

Direct Light: Light emitted directly from the lamp, off of the reflector or reflector diffuser, or through the refractor or diffuser lens, of a luminaire.

Fixture: The assembly that houses the lamp or lamps and can include all or some of the following parts: a housing, a mounting bracket or pole socket, a lamp holder, a ballast, a reflector or mirror, and/or a refractor or lens.

Flood or Spot light: Any light fixture or lamp that incorporates a reflector or a refractor to concentrate the light output into a directed beam in a particular direction.

Foot-candle: A unit of illuminance amounting to one lumen per square foot. A measure of light falling on a given surface. One foot-candle is equal to the amount of light generated by one candle shining on a square foot surface one foot away.

Fully Shielded - A fully shielded luminaire is a luminaire constructed or shielded in such a manner that all light emitted by the luminaire, either directly from the lamp or indirectly from the luminaire, is projected below an angle of 20 degrees below the horizontal plane through the luminaire's lowest light emitting part as determined by photometric test or certified by the manufacturer.

Glare: Light emitting from a luminaire with an intensity great enough to reduce a viewer's ability to see, and in extreme cases causing momentary blindness.

Height of Luminaire: The height of a luminaire shall be the vertical distance from the ground directly below the centerline of the luminaire to the lowest direct-light-emitting part of the luminaire.

Illuminance - The quantity of light arriving at a surface divided by the area of the illuminated surface, measured in foot-candles.

Lamp: The component of a luminaire that produces the actual light.

Light Trespass: The shining of light produced by a luminaire beyond the boundaries of the property on which it is located.

Lumen: A measure of light energy generated by a light source. One footcandle is one lumen per square foot. For the purposes of this Regulation, the lumen-output values shall be the INITIAL lumen output ratings of a lamp.

Luminaire: This is a complete lighting system, and includes a lamp or lamps and a fixture.

Millyard Lighting Theme: A thematic lighting installation that matches, in general, the lighting scheme currently installed at the Newmarket Mills. Lighting fixtures consistent with this theme shall include free-standing and/or building mounted lighting fixtures that are hooked shaped, with downward facing luminaries that may or may not have decorative scroll-work along the pole. Similar lights have been installed at the Newmarket Public Library, Elm Street and can be found in the Newmarket Downtown Vision Plan.

Outdoor Lighting: The night-time illumination of an outside area or object by any man-made device located outdoors that produces light by any means.

Partially shielded - Shall mean outdoor light fixtures shielded or constructed so that no more than ten percent of the light rays are emitted by the installed fixture at angles greater than 20 degrees below the horizontal plan, and shall not extend above the horizontal plane, as certified by a photometry test report.

Temporary outdoor lighting: The specific illumination of an outside area of object by any man-made device located outdoors that produces light by any means for a period of less than 7 days, with at least 180 days passing before being used again.

Uplighting - Any light source that distributes illumination above a 90-degree horizontal plane.

(2) General Lighting Requirements:



- (a) All lighting in the Town of Newmarket is required to have full-cutoff shielding, except for that portion of lighting installation that is consistent with the Millyard Lighting Theme.
  - (b) Up-lighting by any method is prohibited; however, the Planning Board may allow limited use of upward landscape lighting on a case by case basis.
  - (c) Non-cutoff wallpack type fixtures are prohibited.
- (3) Control of Glare – Luminaire Design Factors:
- (a) Any luminaire with a lamp or lamps rated at a total of MORE than 1800 lumens, and all flood or spot luminaires with a lamp or lamps rated at a total of MORE than 900 lumens, shall not emit any direct light above a horizontal plane through the lowest direct-light-emitting part of the luminaire.
  - (b) Any luminaire with a lamp or lamps rate at a total of MORE than 1800 lumens, and all flood or spot luminaires with a lamp or lamps rated at a total of MORE than 900 lumens, shall be mounted at a height equal to or less than the value  $3 + (D/3)$ , where D is the distance in feet to the nearest property boundary. The maximum height of the luminaire may not exceed 25 feet.
  - (c) The luminaire's maximum illuminance shall not exceed the minimum illuminance recommended for that purpose as defined in the most recent "Illuminating Engineering Society Lighting Handbook/References & Applications."
  - (d) Installation of lighting fixtures consistent with the Millyard Lighting Theme shall be exempt from section (c).
- (4) Submission of Plans:
- (a) The submission shall contain but shall not necessarily be limited to the following:
    - i Plans indicating the location on the premises, and the type of illuminating devices, fixtures, lamps, supports, reflectors, and other devices;
    - ii Description of the illuminating devices, fixtures, lamps, supports, reflectors, and other devices and the description may include, but is not limited to, catalog cuts by manufacturers and drawings (including sections where required);

- iii Photometric data, such as that furnished by manufacturers, or similar showing the angle of cut off or light emissions.
- iv A visual impact photometric plan that demonstrates both light coverage and light spillage resulting from the proposed lighting plan.

Additional Submission. The above required plans, descriptions and data shall be sufficiently complete to readily determine whether compliance with the requirements of this regulation are met. If such plans, descriptions and data cannot enable this ready determination, by reason of the nature or configuration of the devices, fixtures, or lamps proposed, the applicant shall additionally submit as evidence of compliance to enable such determination such certified reports of tests as will do so provided that these tests shall have been performed and certified by a recognized testing laboratory.

(5) Exceptions:

- (a) Any luminaire with a lamp or lamps rated at a total of 1800 lumens or LESS, and all flood or spot luminaires with a lamp or lamps rated at 900 lumens or LESS, may be used without restriction to light distribution or mounting height, except that if any spot of flood luminaire rated 900 lumens or LESS is aimed, directed, or focused such as to cause direct light from the luminaire to be directed toward residential buildings on adjacent or nearby land, or to create glare perceptible to persons operating motor vehicles on public ways, the luminaire shall be redirected or its light output controlled as necessary to eliminate such conditions.
- (b) Luminaires used for public-roadway illumination may be installed at a maximum height of 25 feet and may be positioned at that height up to the edge of any bordering property. Proposed streetlights or replacement of existing streetlights shall be fully shielded.

(6) Prohibitions:

- (a) Mercury Vapor Lamps Fixtures and Lamps. The installation of any mercury vapor fixture or lamp for use as outdoor lighting is prohibited.
- (b) Laser Source Light. The use of laser source light or any similar high intensity light for outdoor advertising or entertainment, when projected above the horizontal is prohibited.
- (c) Searchlights. The operation of searchlights for advertising purposes is permitted by permit issued by the building inspector.
- (d) Neon. Neon lighting shall be limited to signage use.

## **LIGHTING DESIGN GUIDELINES**

### **Town of Newmarket**

#### **Why is there outdoor lighting?**

Outdoor lighting is used to illuminate roadways, parking lots, yards, sidewalks, public meeting areas, signs, work sites, and buildings. It provides us with better visibility and a sense of security.

- When well-designed and properly installed, outdoor lighting can be and is very useful in improving visibility and safety and a sense of security, while at the same time minimizing energy use and operating costs.

#### **Why should we be concerned?**

If outdoor lighting is not well-designed and properly installed, it can be costly, inefficient, glary, and harmful to the nighttime environment. These are the issues:

- *Glare:* Poorly-designed or poorly installed lighting can cause a great deal of glare that can severely hamper the vision of pedestrians, cyclists, and drivers, creating a hazard rather than increasing safety. Glare occurs when you can see light directly from the fixture (or bulb).
- *Light Trespass:* Poor outdoor lighting shines onto neighborhood properties and into bedroom windows, reducing privacy, hindering sleep, and creating an unattractive look to the area.
- *Energy Waste:* Much of our outdoor lighting wastes energy because it is not well-designed. This waste results in high operating costs and increased environmental pollution from the extra power generation needs. We waste over a billion dollars a year in the United States alone lighting up the sky at night.
- *Sky Glow:* A large fraction of poor lighting shines directly upwards, creating the adverse sky glow above our cities that washes our view of the dark night sky, taking away an important natural resource. In addition to the cost savings, less sky glow will allow future generations to enjoy the beauty of the stars, and children will be inspired to learn and perhaps to enter fields of science.

#### **What is Good Lighting?**

Good lighting does its intended job well and with minimum adverse impact to the environment. Good lighting has four distinct characteristics:

1. **It provides adequate light for the intended task, but never over-lights.**

Specifying sufficient light for a job is sometimes hard to do on paper. Remember that a full moon can make an area seem quite bright. Some modern lighting systems illuminate areas to a level 100 times as bright as does the full moon! Brighter is not always better, so try to choose lights that will meet your needs without illuminating the neighborhood. If you can't decide what to do, consulting a good lighting designer is usually your best bet.

2. **It uses "fully-shielded" lighting fixtures, fixtures that control the light output in order to keep the light in the intended area.**

Such fixtures have minimum glare from the light-producing source. "Fully-shielded" means that no light is emitted above the horizontal. (High-angle light output from ill-designed fixtures is mostly wasted, doing no good in lighting the ground, but still capable of causing a great deal of glare. Of course, all the light going directly up is totally wasted.)

Fully-shielded light fixtures are more effective and actually increase safety, since they have very little glare. Glare can dazzle and considerably reduce the effectiveness of the emitted light.

3. **It has the lighting fixtures carefully installed to maximize their effectiveness on the targeted property and minimize their adverse impact beyond the property borders.**

Positioning of fixtures is very important. Even well-shielded fixtures placed on tall poles at a property boundary can cast a lot of light onto neighboring properties. This "light trespass" greatly reduces and invades privacy, and is difficult to resolve after the installation is complete.

Fixtures should be positioned to give adequate uniformity of the illuminated area. A few bright fixtures (or ones that are too low to the ground) can often create bright "hot spots" that make the less-lit areas in-between seem dark. This can create a safety problem. When lighting signs, position the lights above and in front of the sign, and keep the light restricted to the sign area; overlit signs are actually harder to read. Buildings ought to be similarly lit in a way to offer an attractive, safe environment without overkill.

4. **It uses fixtures with high-efficiency lamps, while still considering the color and quality as essential design criteria.**

High-efficiency lamps used for lighting not only save energy - which is good for a cleaner environment - but reduce operating costs. Most high-efficiency lamps last a long time, reducing costly maintenance. Highly-efficient fixtures usually cost more initially, but the payback time is very short, and such fixtures will save you lots of money in a short time.

Balancing against high-efficiency, though, is the quality of the light emitted. In some applications, the yellow light cast by low-pressure (LPS) or high-pressure (HPS) sodium lamps may not be as desirable as a less-efficient, but much whiter, compact-fluorescent, metal-halide, or even incandescent light source. In other applications, color is not of importance, and LPS or HPS lamps do a very good job at very low cost. Well-designed shielded lights can usually be lower in wattage, saving even more energy and money. They will actually light an area better than unshielded lights of higher output, because they make use of all the light rather than wasting some (or much) of it.

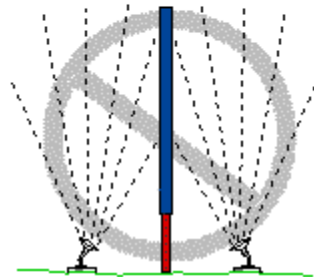
**Why are these characteristics so important? How do they factor into a design?**

Good lighting means that we save energy and money, and we avoid hassles. A quality lighting job makes a "good neighbor." And we have a safer and more secure nighttime environment.

Always remember that lighting should benefit people. Controlled, effective, efficient lighting at a home or business will enhance the beauty, while providing visibility, safety, and security. Poorly-installed, bright lighting is offensive and gives a very poor image.

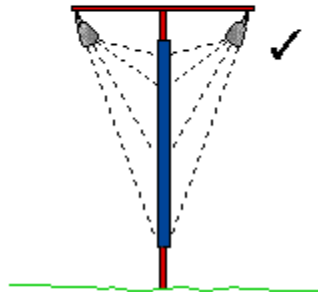
## EXAMPLES OF SOME COMMON LIGHTING FIXTURES

POOR

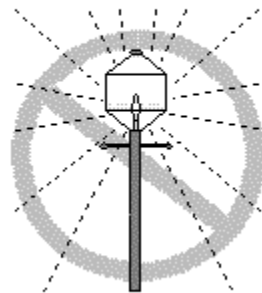


Ground-mounted  
Billboard Floodlights

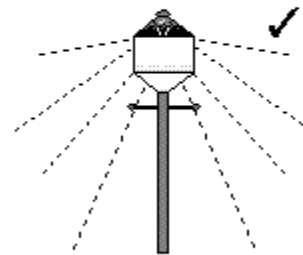
GOOD



Top-mounted  
Billboard Floodlights  
(carefully focused onto billboard)



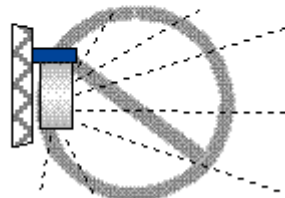
Post-style Lamp  
(more than 1,800 lumens)



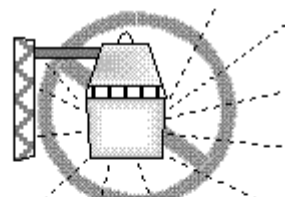
Post-style Lamp  
(lamp set in opaque top)

## EXAMPLES OF SOME COMMON LIGHTING FIXTURES

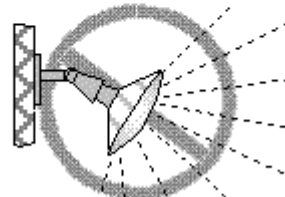
### POOR



Typical "Wall Pack"

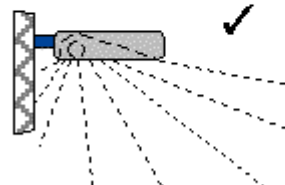


Typical "Yard Light"

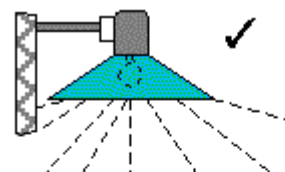


Area Flood Light

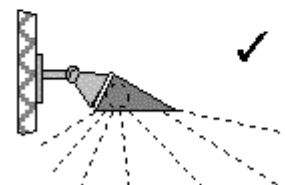
### GOOD



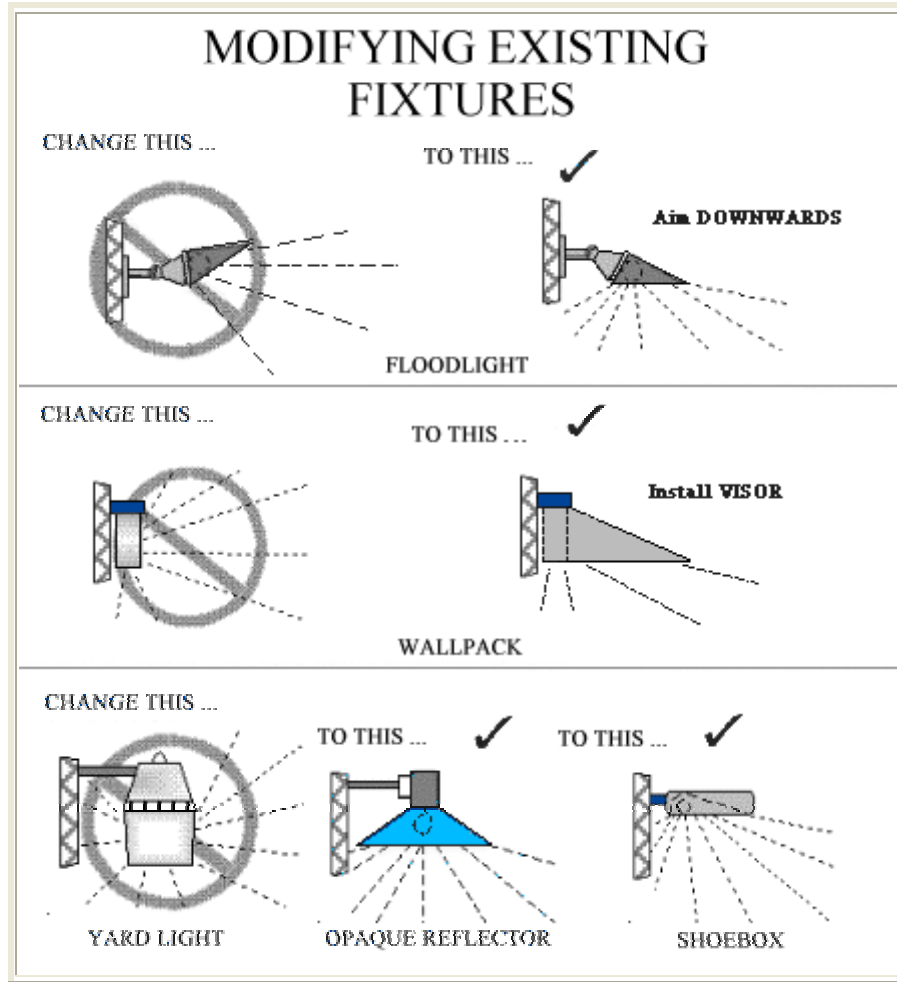
Typical "Shoe Box" (forward throw)



Opaque Reflector (lamp inside)



Area Flood Light with Hood

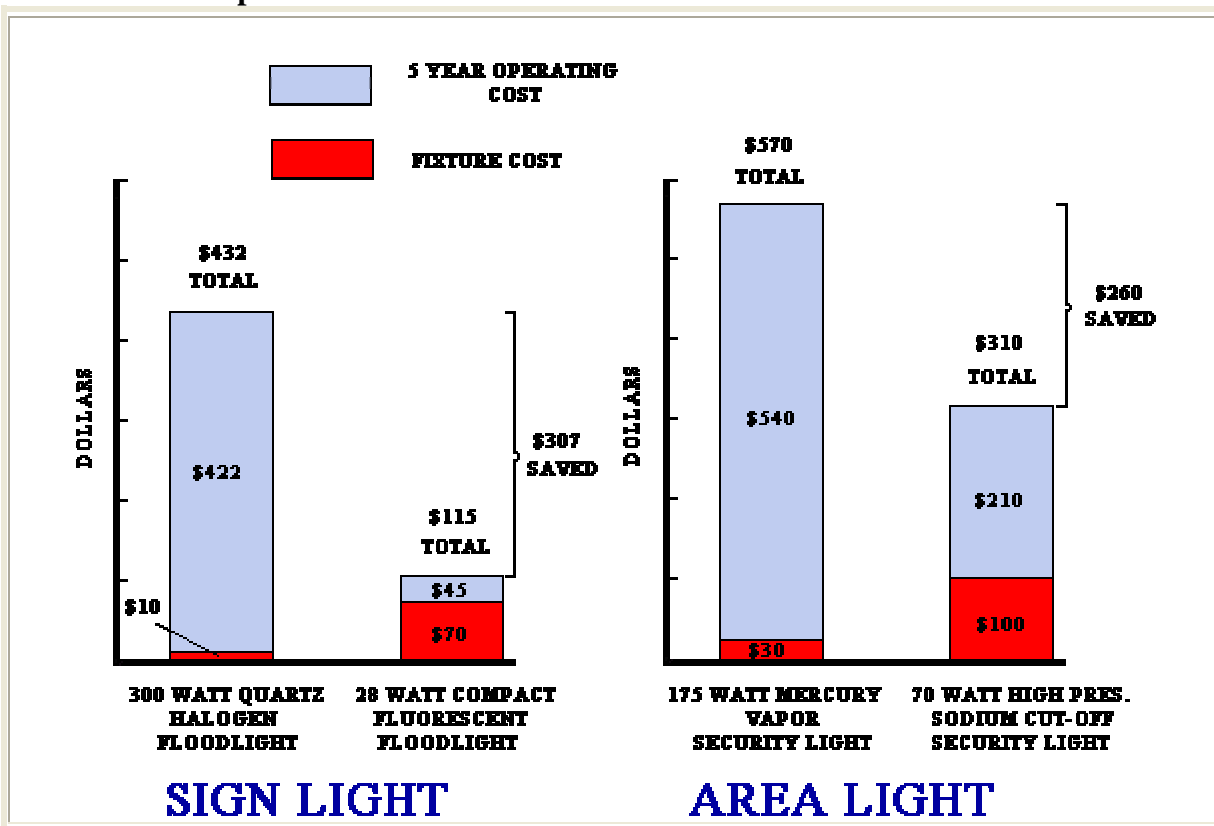


### Some Thoughts on Cost: Money Talks!

**There are many cheap lighting fixtures available from most discount warehouse stores and from electrical suppliers. Are these good deals?**

- Most cheap fixtures have poor control of the light output, and they produce a lot of glare. It usually takes better and more-costly internal reflectors to get light out without glare and to give better light distribution. Modifying installed fixtures to reduce glare, or installing more fixtures to better coverage can be expensive.
- Cheap fixtures often have inefficient lamps and short lamp life, so they use far more energy than needed. Paying for more electricity than needed is expensive, as is the higher maintenance costs of these so-called "cheap" fixtures.

## Some cost comparisons



## Some Basic Considerations

- Always remember that lighting should *benefit people*. Controlled, effective, efficient lighting at your home or business will enhance the surroundings and give a sense of safety and security. People don't appreciate poorly-installed, overly-bright lighting.
- Check your site at night before installing lighting and note the existing light levels. If the area has low levels of lighting, then modest levels of light will work well for you and will fit more hospitably in the neighborhood.
- Try to keep the lighting uniform and *reduce glare* as much as possible. Lights that make bright "hot spots" and ones that have glare make it hard to see well - especially for older people.
- Be aware that light fixtures can have different lighting patterns. (Some patterns are long and narrow light cones, while others are more symmetrical.) Some fixtures have internal adjustments that can change the lighting pattern to a modest extent. Pick the right pattern for your job.
- Consider using lights that turn on by motion detection. Not only will you reap big savings in operating costs, but you will have a far more effective security light due to its "instant-on" characteristics. Note that these lights can also be turned on manually. These light fixtures are not expensive, and they use very little energy. Higher-priced motion-detection units will prove more reliable.